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10/783,567	02/20/2004	Luis F. Barron	DP-311107	7552
7590 JIMMY L. FUNKE DELPHI TECHNOLOGIES, INC. Legal Staff Mail Code: 480-410-202 P.O. Box 5052 Troy, MI 48007-5052			EXAMINER BASTIANELLI, JOHN	
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* LUIS F. BARRON and VISWANATHAN SUBRAMANIAN

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Appeal 2008-1170  
Application 10/783,567  
Technology Center 3700

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Decided: May 30, 2008

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Before TERRY J. OWENS, ANTON W. FETTING, and STEVEN D.A. MCCARTHY, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellants appeal from a rejection of claims 1, 4-7, and 9-11, which are all of the pending claims.

THE INVENTION

The Appellants claim a solenoid valve for a vehicle. Claims 1 and 7 are illustrative:

1. A solenoid valve, comprising:  
a valve housing supporting a coil;

a ball in the valve housing;  
a valve seat in the valve housing; and  
a rod reciprocatingly disposed in the valve housing between a deenergized configuration, wherein the coil is deenergized and the ball is against the valve seat, and an energized configuration, wherein the coil is energized and the rod is urged against the ball to move the ball away from the valve seat, wherein the rod is distanced from the ball by between one tenth and eight-tenths of a millimeter (0.1mm-0.8mm) inclusive, when in the deenergized configuration.

7. A solenoid valve for a vehicle, comprising:

a valve housing holding a rod, a ball, and forming a valve seat therebetween, wherein the valve housing is formed with at least one ball retainer rib defining a supply port having a first diameter, the ball being disposed between the rib and valve seat and defining a second diameter larger than the first diameter such that the rib retains the ball from passing outward through the supply port, wherein said rib is deformable such that the ball is pressable through the rib into the location between the rib and the ball seat, the valve housing also defining a winding bay, a coil being wound in the winding bay.

#### THE REFERENCES

Gaylord	US 3,907,046	Sep. 23, 1975
Teranishi	US 5,282,329	Feb. 1, 1994
Okazaki	US 5,915,416	Jun. 29, 1999

### THE REJECTIONS

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1 and 4-6 over Okazaki in view of Teranishi, and claims 7 and 9-11 over Okazaki in view of Gaylord.

### OPINION

We reverse the Examiner's rejections.

#### Rejection over Okazaki in view of Teranishi

We need to address only the sole independent claim among claims 1 and 4-6, i.e., claim 1. That claim requires that in an energized configuration, a rod is distanced from a ball by between 0.1 mm and 0.8 mm. For that claim requirement the Examiner relies upon Teranishi (Ans. 3).<sup>1</sup>

Teranishi discloses a solenoid valve having a connecting rod (25) that parts from a valve disc (17) (which corresponds to the Appellants' ball) to reduce hysteresis (col. 5, ll. 40-42).

The Examiner argues that Teranishi's "rod is seen to move away from the ball by at least .1 mm at some point when de-energized which meets the between a range of .1-.8 mm when in a de-energized configuration" (Ans. 5).<sup>2</sup>

Teranishi does not disclose the distance rod 25 moves away from valve disc 17. The Examiner's argument is based upon the assumption that the distance is at least 0.1 mm and that, therefore, as rod 25 moves away

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<sup>1</sup> The Appellants do not dispute that Okazaki discloses the other limitations in claim 1 (Br. 4-5; Reply Br. 1-3).

<sup>2</sup> Actually, Teranishi's rod 25 parts from valve disc 17 in the energized configuration (figs. 3c, 5c), not in the deenergized configuration (figs. 3a, 5a) (col. 5, ll. 24-32).

from valve disc 17 the distance at some point is within the 0.1-0.8 mm range, thereby meeting the Appellants' claim requirement. The "Background of the Invention" section of the Appellants' Specification, however, states that in the prior art, "[t]o minimize rod wear against the ball, in the deenergized configuration the rod is positioned against or very close to (e.g., distanced very much less than 0.1 mm from) the ball" (Spec. 1:18 – 2:2). Thus, the record indicates that the prior art distance between the rod and ball was very much less than 0.1 mm, and the Examiner has not established that Teranishi would have led one of ordinary skill in the art to use a distance of at least 0.1 mm.

The Examiner, therefore, has not established a prima facie case of obviousness of the invention claimed in the Appellants' claims 1 and 4-6.

#### Claims 7 and 9-11

We need to address only the sole independent claim among claims 7 and 9-11, i.e., claim 7. That claim requires a rib that "is deformable such that the ball is pressable through the rib into the location between the rib and the ball seat."<sup>3</sup> For that claim requirement the Examiner relies upon Gaylord (Ans. 4), as follows:

Okazaki lacks the rib being deformable.<sup>[4]</sup> Gaylord discloses a deformable rib 30 in which a valve passes through. It would have been obvious to one having ordinary skill in the art at the time the

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<sup>3</sup> The Examiner's argument that this claim requirement renders the claim a product-by-process claim is incorrect (Ans. 4). The feature "deformable such that the ball is pressable through the rib" is a structural characteristic of the rib, not a process step.

<sup>4</sup> What the Examiner refers to as Okazaki's rib is retainer 52 which is inserted into input port 42 and fixed by thermally caulked section 41g for preventing ball 51 from coming off (col. 6, ll. 9-11; fig. 1).

invention was made to make the rib of Okazaki deformable as disclosed by Gaylord in order to take less steps in assembling the valve.

Unlike Okazaki, which discloses a three-way electromagnetic valve (col. 1, ll. 6-8), Gaylord discloses a downhole bypass valve that allows circulation of liquids through an oil well without passing through the drill bit (col. 1, ll. 2-5). Gaylord's item 30 is a valve seat, not a rib (col. 2, ll. 54-56). Valve seat 30 is deformable so that deformable valve plug 62 can pass through it (col. 3, ll. 51-54; col. 4, ll. 19-24, 46-48; figs. 1, 2a).

The Examiner has not established that Gaylord's disclosure of a valve seat that is deformable to permit a valve plug to pass through it would have led one of ordinary skill in the art to make Okazaki's retainer 52, which prevents a ball from passing through it, out of deformable material. The Examiner has not explained how the Examiner's argued reason for doing so, i.e., "to take less steps in assembling the valve" (Ans. 4), follows from the disclosures in the applied prior art.

The Examiner, therefore, has not established a prima facie case of obviousness of the invention claimed in the Appellants' claims 7 and 9-11.

#### DECISION

The rejections under 35 U.S.C. § 103 of claims 1 and 4-6 over Okazaki in view of Teranishi, and claims 7 and 9-11 over Okazaki in view of Gaylord are reversed.

#### REVERSED

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Application 10/783,567

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JIMMY L. FUNKE  
DELPHI TECHNOLOGIES, INC.  
Legal Staff Mail Code: 480-410-202  
P.O. Box 5052  
Troy MI, 48007-5052